Relationships of age and reproductive characteristics with plasma estrogens and androgens in premenopausal women

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Journal: Cancer Epidemiol Biomarkers Prev 1995; 4(4):381-6

Abstract: We used data from a cross-sectional study of 107 premenopausal women to evaluate the relation of age, menarcheal age, parity, and age at first live birth with plasma estrogen and androgen levels in premenopausal women. Fasting blood specimens were collected on each of days 5-7, 12-15, and 21-23 of menstrual cycles of the participants and pooled to create follicular, midcycle, and luteal phase samples, respectively, for each woman. Age was associated significantly and positively with plasma estradiol levels during the follicular phase [percentage difference/year = 2.6; 95% confidence interval (CI) = 1.0-4.2] and midcycle (percentage difference/year = 2.7; 95% CI = 0.9-4.7) but not the luteal phase (percentage difference/year = -0.4; 95% CI = -1.9-1.3) of the menstrual cycle. The relation of age to plasma estradiol varied by parity, with significant interactions during midcycle and luteal phase. Among nulliparous women, plasma estradiol levels increased with age midcycle and during the luteal phase, but among parous women estradiol levels decreased with age during these phases of the menstrual cycle. Plasma estrone increased with age in all women during the follicular phase of the menstrual cycle (percentage difference/year = 1.5; 95% CI = 0.2-2.8). During the luteal phase there was a significant interaction with parity; estrone levels in nulliparous women varied only slightly with age, but levels in parous women decreased significantly as age increased. The androgens, androstenedione and dehydroepiandrosterone sulfate decreased, and sex hormone-binding globulin increased as age increased. The results of this cross-sectional study suggest that pregnancy may modify age-related changes in plasma estrogen levels.